

*Abstract of the Disclosure*

[0052] A photodetector for use with relatively thin (i.e., sub-micron) silicon optical waveguides formed in a silicon-on-insulator (SOI) structure comprises a layer of poly-germanium disposed to couple at least a portion of the optical signal propagating along the silicon optical waveguide. Tight confinement of the optical signal within the waveguide structure allows for efficient evanescent coupling into the poly-germanium detector. The silicon optical waveguide may comprise any desired geometry, with the poly-germanium detector formed to either cover a portion of the waveguide, or be butt-coupled to an end portion of the waveguide. When covering a portion of the waveguide, poly-germanium detector may comprise a “wrap-around” geometry to cover the side and top surfaces of the optical waveguide, with electrical contacts formed at opposing ends of the detector.